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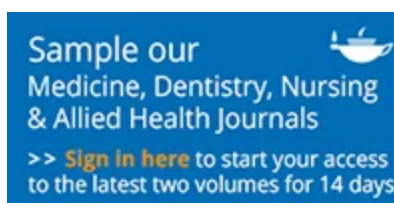
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Review

# The biological effects of electromagnetic exposure on immune cells and potential mechanisms

Chuanfu Yao , Li Zhao &amp; Ruiyun Peng

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## ABSTRACT

Anxiety about potential health hazards of electromagnetic exposure has been growing in the past decades, with their widely application in many fields. The immune system plays pivotal role in maintaining body's homeostasis. Importantly, immune system is also a sensitive target for electromagnetic fields. In recent years, the biological effects of electromagnetic fields on immune cells have been attracting more and more attentions. Accumulated data suggested that electromagnetic exposure could affect the number

and function of immune cells to some extent, including cell proportion, cell cycle, apoptosis, killing activity, cytokines contents and so on. The research objects basically covered all types of immune cells, mainly on PBMC, T lymphocytes, B lymphocytes, NK cells and macrophages. Meanwhile, there also are negative reports of electromagnetic fields on immune cells. This article reviews the results of epidemiological investigation, the progresses in animal studies and in vitro experiments, and the current attempts to explore potential mechanisms. Knowledge of the biological effects on immune cells associated with electromagnetic fields is critical for proper health hazard evaluation, development of safety standards, and safe exploitation of new electromagnetic devices and applications.

**Q KEYWORDS:** Electromagnetic exposure immune cells biological effects mechanism

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No potential conflict of interest was reported by the authors.

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## Additional information

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